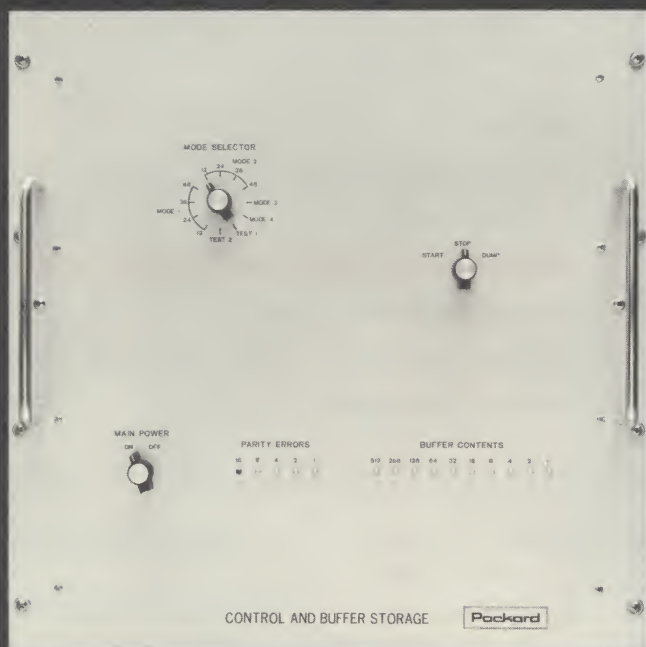


Packard

Model 123 Buffer-Organizer

Bulletin 1088



General Description

The Model 123 Buffer-Organizer portion of the Packard Multiparameter Analyzer System is employed to assemble words for presentation to and storage on magnetic tape in a computer compatible form. Words will be assembled in BLOCKS of predetermined length with a maximum of 1008 CHARACTERS. The BLOCK length may be varied by a front panel switch to accommodate several computer formats.

Inherent to the design of the Buffer-Organizer is its capability to act as a serializer so that WORDS or FIELDS of great length (up to 96 bits) can be presented to the magnetic tape system in the proper manner; i.e. a six BIT CHARACTER with parity. Readout from the magnetic tape deck also feeds through the Buffer-Organizer which directs the data either directly to the Computer-Memory or to the Digital Gate network. When the Buffer-Organizer has presented an entire BLOCK of data to the storage device, another BLOCK will be transferred and this process will continue until the experimental requirements have been fulfilled.

Operation

Experimental data applied to the Buffer-Organizer for magnetic tape generation may be simultaneously applied to the Digital Gate for presentation to the Computer-Memory Unit. This can be most useful for coarse study of the experimental data, and for the initial set up required to establish the parameters of the experiment. The PERMANENT DISPLAY feature of the Computer-Memory Unit can also be used as an on-line monitor of the data acquisition system. (In addition to processing WORDS resulting directly from the initial converters, the magnetic tape system can also be used as a fast readout-readin device for the Computer-Memory. One can accumulate a spectra in the Computer-Memory and subsequently readout into the magnetic tape for processing in a computer.)

The system will transfer a forty-eight bit WORD to the Buffer-Organizer input register. If WORDS or FIELDS of greater length are used (up to 96 bits) a transfer programmer will control the transfer process so that transfer of the first four parameters (corresponding to no more than 48 bits)

will occur followed by transfer of the second four parameters. Each BLOCK of data is preceded by an eighteen BIT identification TAG. The information recorded in this TAG will be used for searching for significant AREAS recorded on the tape for reading back into data processing equipment. Other information as well as block identification can be recorded in the TAG.

Another feature of the Buffer-Organizer is the ability to test not only the experimental data acquisition system itself and the magnetic tape deck, but the reels of magnetic tape which are to be used. This is accomplished by virtue of a special input board which will write data onto the tape in such a manner as to utilize the entire tape for data storage. The Digital Gate can also be tested by the same means; i.e., one can select digital windows which will either pass the words written on the tape or block them, thereby providing a simple, quick check on the entire system before operation.

The Buffer-Organizer is designed to be completely compatible with the Packard Multiparameter Analyzer instrumentation; for example, if one were to add a Time-of-Flight coding unit in the future, it could be coupled into the system without any modifications being required.

The packing density on the magnetic tape is offered at 556 CHARACTERS per inch, but the facility for 200 and 800 CHARACTERS per inch is included. The maximum input rate to the Buffer-Organizer is a function of the WORD length. For example, a twenty-four bit WORD can be processed at the rate of about 2,500 events per second. If the WORD length is shorter, the number of events per second will increase; e.g., if one were to write a twelve bit WORD into the Buffer-Organizer, the maximum rate would approximate 5,000 events per second. The Buffer-Organizer employs separate input and output registers so that while data is being accepted it may also be applied to the magnetic tape deck. One, therefore, has simultaneous read-in, read-out facilities to maximize the acceptable counting rate and to avoid fixed blocks of dead time.

In addition to the simultaneous in-out capabilities of the Buffer-Organizer, a parity error counter is also included to indicate the number of parity errors and to serve as an alarm in the event of incorrect operation.

General Operating Requirements

Mode I:*

Accept 48, 36, 24 or 12 bit binary WORDS at random rate, organize these in computer-compatible form in BLOCKS of up to 1008 characters and place these BLOCKS on tape.

*96 bit words optional

Mode II:

The tape prepared in Mode I can be read and reorganized for presentation to Packard equipment.

Mode III:

Accept 20 bits of BCD from Model 45 Computer Memory in either four 6-bit characters or six 6-bit characters and record these on magnetic tape.

Mode IV:

Read the Mode III tape and transfer these data back into the Computer-Memory for further analysis.

General Specifications

Internal logic circuitry.....Micrologic electronics

Interface compatibility.....obtained by changing specific boards

Buffer contents indicator.....10 lights binary character counter

Parity error indicator.....5 lights binary parity error counter

End-of-tape signal.....Input to Buffer-Organizer to completely inhibit system

Word length.....front panel switch 48*, 36, 24 or 12 bits

Data dump.....switch to "dump" unfinished BLOCKS onto tape. Missing data positions are filled with zeros

Stop command....control Buffer and Tape Deck, but will not stop until interrecord gap is reached

Tag identification....18 BITS on lines other than data lines for BLOCK I.D.

Input register.....48 bits

Output register.....48 bits

I.D. register.....18 bits

Mode selector....12 position switch determining mode of operation and input WORD length

Start-stop-dump switch....determine automatic operation, stop and manual dump

*96 bits optional

